REQUEST FOR RECONSIDERATION

Claims 1-5, 7-8, 10-12 and 17-18 remain active in this application.

The claimed invention is directed to a process for producing closed-celled **rigid** polyurethane foams which comprises reacting a graft polyol with a crude MDI in the presence of catalysts and blowing agents, as well as to a graft polyol which may be used to produce closed-celled **rigid** polyurethane foams.

Rigid polyurethane foams having a closed-cell structure are known for thermal insulation. Reduced **molding times** and good **mold flow properties** are still sought in closed-celled rigid polyurethane foam producing processes.

The claimed invention addresses this problem by providing a process for preparing **rigid** closed-cell polyurethane foam comprising reacting polyisocyanate with a compound having at least two reactive hydrogen atoms in the presence of catalyst and a blowing agent, wherein the compound having at least two hydrogen atoms comprises **at least one graft polyol** having **a hydroxyl value of from 100 to 800 mg KOH/g**. Applicants have discovered that such a graft polyol provides for good properties in the process for producing a closed-celled **rigid** polyurethane foam and is able to provide for crosslinking densities of the polyurethane network, which are higher than when using graft polyols based on flexible foam carrier polyols (pg 6, lines 33-35 of applicants' specification). Such a process is nowhere disclosed or suggested in the cited art of record.

The rejections of claims 1-5, 7, 8, 10-12, 17 and 18 under 35 U.S.C. §103(a) in view of Haider et al. U.S. 2004/0014828, in view of Matsumoto et al. U.S. 6,117,937 in view of EP 786,480 is respectfully traversed.

None of the cited art of record discloses or suggests an enhancement in compressive strength with improved demolulding properties in a process of producing a closed-cell **rigid**

polyurethane foam with a graft polyol having a hydroxyl value of from 100 to 800 mg KOH/g.

Haider et al. describes a water-blown **rigid** polyurethane in which the polyol mixture comprises i) at least one polymer polyol, ii) at least one polyol having a hydroxyl value of from about 200 to about 800, and iii) optionally at least one polyol having a hydroxyl value ranging from about 25 to about 115 (see abstract). **Polymer** polyols are described in paragraph [0011] as including PHD polymer polyols and SAN polymer polyols having low hydroxyl values, but none having a hydroxyl value of from 100-800 as claimed.

Matsumoto et al has been cited for a disclosure of a polymer polyol having a hydroxyl value 600 mg KOH/g (paragraph column 4, lines 37-41). However, the reference is directed to preparation of **a flexible polyurethane foam** (column 1, lines 23-26) and **not** to a closed cell **rigid** polyurethane foam.

In contrast, the claimed invention is directed to a process for producing closed-celled rigid polyurethane foams by reacting a graft polyol having a hydroxyl value of from 100 to 800 mg KOH/g. applicants observe an enhancement in compressive strength with improved demoulding properties when using a graft polyol having a hydroxyl number of from 100-800 mg KOH/g.

As evidence of such an enhancement in compressive strength applicants have previously submitte the declaration of Dr. Andreas Emge, a named inventor of the above-identified application.

Dr. Emge tested the compressive strength, demoulding thickness, thermal conductivity and flowability for three rigid polyurethane foams, Example 1, containing no graft polyol, Example 2 containing a graft polyol having a hydroxyl number of only 36 mg KOH/g and example 3 having a graft polyol having a hydroxyl number of 160 mg KOH/g

according to the claimed invention. For the examiner's convenience a portion of the data is again reproduced below:

	Example 1 Reference	Example 2	Example 3
Sucrose/glycerine-PO polyol, hydroxyl Number 450 mg KOH/g	48	48	48
TDA-EO-PO polyol, Hydroxyl Number 400 Mg KOH/g	30	30	30
TMP-PO polyol, Hydroxyl number 160 mg KOH/g	16	-	-
Graftpolyol 1	-	16	-
Graftpolyol 2	-	-	16
Catalyst package	2.1	2.1	2.1
Tegostab B8462	1.9	1.9	1.9
Water	2.3	2.3	2.3
Cyclopentane (70%) isopentane (30%)	13	13	13
Gel time [s]	39	36	35
Free rise density [g/l]	24.4	23.4	23.5
Polyol Viscosity [mPas]	6900	15700	12000
Compressive strength, foam sample 15% overpack [N/mm^2]	15.5	14.8	16.3
Demoulding thickness (after 3 min, 15% overpack) [mm]	94.8	93.3	93.9
Thermal conductivity [mW/mK]	19.7	19.6	19.2
Flowability	1.31	1.34	1.36

Each of examples 2 and 3 containing a graft polyol demonstrated an improved demoulding property by about 1 mm as compared with Example 1 containing no graft polyol. A higher moulding thickness results in a higher cycle time and therefore slower processing.

However, compressive strength as measured according to DIN 53421/DIN EN ISO 604) for example 2 containing a graft polyol similar to that of Haider et al displayed a slightly deteriorated compressive strength as compared with example 1, while example 3 prepared with a graft polyol having a hydroxyl number of 160 mg KOH/g had an improved compressive strength. Thus by selection of a graft polyol having a hydroxyl number of form 100 to 800 mg KOH/g, applicants are able to realize a faster processing in terms of reduced

demoulding thickness and an enhancement in compressive strength. Such a result is nowhere disclosed or suggested from the cited combination of references.

Further more, there would have been no expectation of enhancing the demoulding thickness and compressive strength by using the polyol of Matsumoto et al. in the process of Haider et al. for preparing closed cell rigid polyurethane, since the polyol of Matsumoto et al. is used to prepare a flexible polyurethane foam having a open cell structure (column 2, lines 26-32 and column 12, lines 55-57). There would have been no expectation of enhancing the demoulding thickness and compressive strength by using the polyol of Matsumoto et al. in the preparation of a closed cell rigid polyurethane foam.

While page 6 of the official action asserts that the data has not persuasively demonstrated unexpected results for the combination as claimed, applicants note that the enhancements in demolding thickness of 93.3 mm and 93.9 mm for examples 2 and 3 as compared with 94.8 mm for example 1 reference is a 32% improvement. Such an enhancement would allow a manufacture to **decrease the cycle time** and therefore increase productivity of production of foamed articles. Such an increase in productivity without compromising other foam parameters represents a significant improvement in closed-cell rigid polyurethane foam processing technology.

In support of the significance of applicants' demonstrated improvement is demoulding thickness, applicants enclose herewith as evidence the opinion declaration of Dr. Marc Fricke, a researcher with BASF Polyurethanes GmbH, a subsidiary of the assignee BASF AG, now BASF SE. In Dr. Fricke's opinion, the evidence provided in the Emge declaration of January 7, 2010 provided evidence of a significant enhancement in a process for producing a closed-cell rigid polyurethane foam.

As the cited combination of references fails to disclose or suggest an enhancement in demoulding thickness and compressive strength in a process in which a graft polyol having a

hydroxyl value of 100 to 800 mg KOH/g is used in the preparation of a closed cell rigid polyurethane foam, the claimed invention would not have been obvious and withdrawal of the rejection under 35 U.S.C. §103(a) is respectfully requested.

Applicants submit that this application is now in condition for allowance and early notification of such action is earnestly solicited.

Respectfully submitted,

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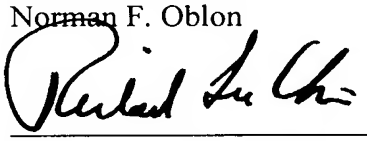

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